

WHAT IS CLAIMED IS:

1. A sheet sucking/removing method for sucking, by suction cups, an uppermost sheet among a plurality of stacked sheets, and separating the uppermost sheet from another sheet therebeneath, and removing the uppermost sheet, and conveying and supplying the uppermost sheet to a subsequent process, said method comprising:

carrying out the sucking/removing by the suction cups in a first negative pressure state in which a suction negative pressure of the suction cups is a minimum pressure needed in order to suck and remove only the uppermost sheet; and

after the sucking/removing, carrying out the conveying/supplying by the suction cups in a second negative pressure state in which the suction negative pressure of the suction cups is a pressure needed for the conveying/supplying.

2. The method of claim 1, further comprising detecting the suction negative pressure of the suction cups by a sensor, wherein setting of the suction negative pressure of the suction cups in the first negative pressure state includes a step of opening to the atmosphere by operation of an electromagnetic valve, and setting of the suction negative pressure of the suction cups in the second negative pressure state includes a step of controlling at least by the operation of the electromagnetic valve.

3. The method of claim 1, further comprising:

detecting the first negative pressure state and the second negative pressure state by a sensor; and

in accordance with results of the detecting, controlling a vacuum pump connected to the suction cups.

4. The method of claim 1, further comprising:

starting the sucking/removing immediately at a point in time when the suction negative pressure of the suction cups reaches the first negative pressure; and

after the sucking/removing, starting the conveying/supplying of the sheet at a point in time when the suction negative pressure of the suction cups reaches the second negative pressure.

5. A sheet sucking/removing device for sucking an uppermost sheet among a plurality of stacked sheets, separating the uppermost sheet from another sheet therebeneath, removing the uppermost sheet, and conveying and supplying the uppermost sheet to a subsequent process, said device comprising:

a plurality of suction cups provided along a transverse direction of the sheet, and sucking/removing the sheet by negative pressure, and conveying/supplying the sheet;

a negative pressure generating source connected to the respective suction cups, and generating a first negative pressure

which is a minimum pressure needed in order for the respective suction cups to suck and remove only the uppermost sheet, and generating thereafter a second negative pressure needed for the conveying/supplying; and

a negative pressure controlling device which is capable of controlling the suction negative pressure of the respective suction cups to a state of the first negative pressure and a state of the second negative pressure,

wherein the suction negative pressure of the respective suction cups is controlled to the first negative pressure by the negative pressure controlling device and the sucking/removing is carried out by the respective suction cups, and after the sucking/removing, the suction negative pressure of the respective suction cups is controlled to the second negative pressure by the negative pressure controlling device and the conveying/supplying is carried out by the respective suction cups.

6. The sheet sucking/removing device of claim 5, wherein the negative pressure generating source includes a vacuum pump connected to the suction cups via a conduit.

7. The sheet sucking/removing device of claim 6, wherein the negative pressure controlling device comprises an electromagnetic two-way type valve and a variable throttle valve equipped with a check valve, and the electromagnetic two-way type

valve and the variable throttle valve equipped with a check valve are connected to the conduit.

8. The sheet sucking/removing device of claim 7, further comprising a sensor switch which is capable of detecting the first negative pressure and the second negative pressure, and which can operate the electromagnetic two-way type valve.

9. The sheet sucking/removing device of claim 5, wherein the sheet sucking/removing device is applicable to an automatic printing plate exposure device.